

REMARKS

Claims 1-17 are in this application. Claims 1-9 and 13-15 were rejected as unpatentable over the prior art. Claims 10-12 were objected to as being dependent upon a rejected base claim. Reconsideration of the claims as amended is respectfully requested.

The invention relates to a digital photographic reproduction system. In such systems photographic information is produced in the form of pixels. To improve resolution, it is known to divide the pixels into partial images laterally offset from each other. For example, as shown in Fig. 2, four pixels 52 are illustrated with, each pixel comprising four partial images (area elements) 50.

If the size of the image on the photo sensitive paper is increased (see Fig. 3), in the prior art the magnification increases the size of the individual partial images 50. This causes a reduction in resolution. Also, as explained in the specification, particularly if the magnification of the images is large, the boundaries between the partial images become fuzzy and there is overlapping of adjacent partial images (referred to sometimes as surface elements). This leads to reduced quality and brilliance of the image. To avoid this problem, it is necessary to exchange certain components of the optical system which produce the partial images, depending on the format size of the image.

The present invention avoids this problem by providing a system in which the size of the partial images on the light sensitive material exposed to the light rays is not dependent on a mask but which, instead, is determined by the optical properties of the projection system. It accomplishes this by bundling the light rays into beams and allowing only those rays that are approximately parallel to the optical axis of the projection system to reach the image plane. As a result, the partial images have a defined size. Image resolution can be adjusted in the case of a larger format size by increasing or decreasing the size of the partial images and by producing a commensurately lower or higher number of partial images. For example, as shown in Figure 4, in which the image area compared to Figure 2 is increased, the partial images 50 are the same size but there are nine partial images for each pixel whereas in Figure 2 there are only four.

The principal references cited by the Examiner have nothing whatsoever to do with applicant's invention. Mai relates "to a photolithography system and method, such as can be used in the manufacture of semi-conductor integrated circuit devices" (col. 1, lines 13-16). As shown in Figs. 3A and 3B "it is desired that each pixel element exposed onto a site overlap previous pixel element exposures" (col. 4, lines 25-27). Thus, not only is Mai not concerned with the subject matter of applicant's invention (the digital reproduction of photographic images) he expressly seeks to achieve that which applicants' invention seeks to avoid, i.e. overlapping of the images.

Much the same can be said for Kato et al. which "relates to an exposure apparatus used for manufacturing a micro device such as a semi-conductor device or liquid crystal display device..." (col. 1, lines 9-11). In the summary of the invention, Kato et al. state:

"It is another object of the present invention to provide a method which can manufacture a favorable micro device (semi conductor device, liquid crystal device, thin film magnetic head, or the like) having a large area upon overlapping exposure by using the exposure apparatus of the present invention."

Thus, Kato et al. state expressly that it is an object of their invention to achieve overlapping whereas in applicant's invention, the object is to avoid overlapping.

Applicant's claims 1-12 are apparatus claims with claim 1 being the independent claim. Claims 13-15 are method claims with claim 13 being the independent claim. Both independent claims have been amended to specify that the projected images may occur "in different size formats" and both claims have been amended to specify that there is "substantially no overlap between adjacent partial images on the light sensitive material."

Since neither of the principal references is concerned with the reproduction of photographic images of the type to which applicant's invention relates and since both references require overlapping of adjacent images, claims 1 and 13 clearly distinguish over these references.

Method claim 14 further distinguishes over the references in specifying that "the area exposed by each one of said light beams (from bundling the light rays) on said light sensitive

material is dependent on the format size of the image on the light sensitive material.” Claim 15 which depends from claim 14, further distinguishes the invention in requiring that the number of partial images be selected depending on the format size of the image. Clearly, the concepts of varying the size and number of partial images depending on image format size is not disclosed in the prior art.

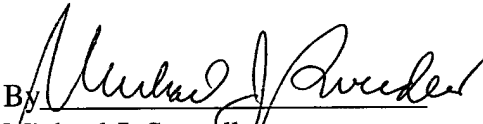
Apparatus claims 16 and 17 which depend from claim 1 and are similar in scope to method claims 14 and 15, have been added to ensure coverage for the apparatus as well as the method.

The Examiner’s indication that claims 10-12 contain patentable subject matter is gratefully acknowledged.

For the foregoing reasons, claims 1-17 are believed to be in condition for allowance and early allowance thereof is respectfully requested.

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Respectfully submitted,

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